

REMARKS/ARGUMENTS

In the Office Action of February 20, 2009, claims 1 and 4-10 are rejected. In response, claims 1, 4, 5 and 8-10 have been amended to correct informalities. Additionally, new claims 11-14 have been added. Applicants hereby request reconsideration of the application in view of the amendments and the below-provided remarks.

Claim Rejections under 35 U.S.C. 103

Claims 1 and 4-10 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Knutson et al. (U.S. Pat. No. 4,035,695, hereinafter “Knutson”) in view of Shimizu (JP11177367). Applicants respectfully submit that the pending claims are not obvious over Knutson in view of Shimizu for the reasons provided below.

Independent Claim 1

Amended claim 1 recites in part “*a mutual inductance that is determined based on a turning direction of said printed coil, a direction of winding of said air coil and a length of said air coil,*” which is not disclosed by Knutson and Shimizu. As a result, Applicants respectfully submit that claim 1 is not obvious over Knutson in view of Shimizu.

As noted on pages 2 and 3 of the Office Action, Knutson does not disclose “wherein the total inductance of the inductive-system is substantially equal to an inductance of the printed coil plus an inductance of the air coil plus a mutual inductance which is based on a direction of said printed coil, a direction of said air coil and a length of said air coil.” Thus, Knutson also does not disclose “*a mutual inductance that is determined based on a turning direction of said printed coil, a direction of winding of said air coil and a length of said air coil,*” as recited in amended claim 1.

Shimizu teaches that air cored coils (12) and (13) are attached to a substrate (11). (See the figure and paragraph [0006] on the four translated pages). The air cored coils (12) and (13) have air inside the coils. As a result, each of the air cored coil (12) and the air cored coil (13) is not a “*printed coil,*” as recited in claim 1. Thus, Shimizu also does

not teach “*a mutual inductance that is determined based on a turning direction of said printed coil, a direction of winding of said air coil and a length of said air coil*” (emphasis added), as recited in amended claim 1.

Additionally, Shimizu teaches that the coupling coefficient between the air cored coil (12) and the air cored coil (13) is adjusted by changing the position of the winding of the air cored coil (13) within the air cored coil (12). (See paragraph [0006] on page 3 of the four translated pages). Shimizu further teaches that by putting the air cored coil (13) in the air cored coil (12) in accordance with the direction of a roller, a coupling coefficient is enlarged and the bandwidth of a double tuned circuit can be made large. That is, Shimizu teaches adjusting the coupling coefficient between two air cored coils (12) and (13) through changing the relative position of the air cored coil (13) within the air cored coil (12). However, Shimizu fails to teach changing **the direction of the winding** of the air cored coil (12 or 13). Additionally, Shimizu fails to teach changing the turning direction of the air cored coil (12 or 13) and the length of the air core coil (12 or 13). Thus, Applicants respectfully submit that Shimizu fails to teach “*a mutual inductance that is determined based on a turning direction of said printed coil, a direction of winding of said air coil and a length of said air coil*,” as recited in claim 1.

As a result, Applicants respectfully submit that claim 1 is not obvious over Knutson in view of Shimizu.

Dependent Claims 4-7

Claims 4-7 depend from and incorporate all of the limitations of independent claim 1. Thus, Applicants respectfully assert that claims 4-7 are allowable at least based on an allowable claim 1. Additionally, claim 4 recites that “*the mutual inductance increases with the length of the air coil until a maximum overlapping area between the printed coil and the air coil has been reached*,” which is not taught by Shimizu.

As described above, Shimizu teaches that air cored coils (12) and (13) are attached to a substrate (11) and that the coupling coefficient between the air cored coil (12) and the air cored coil (13) is adjusted by changing the position of the winding of the air cored coil (13) within the air cored coil (12). However, as shown in the figure on the first page of the four translated pages, the two air cored coils (12) and (13) do not

overlap. Thus, Applicants respectfully submit that Shimizu fails to teach that “*the mutual inductance increases with the length of the air coil until a maximum overlapping area between the printed coil and the air coil has been reached,*” as recited in claim 4.

Independent Claim 8

Independent claim 8 includes similar limitations to independent claim 1. Because of the similarities between independent claim 8 and independent claim 1, Applicants respectfully submit that claim 8 is also not obvious over Knutson in view of Shimizu.

Independent Claim 9

Independent claim 9 includes similar limitations to independent claim 1. Because of the similarities between independent claim 9 and independent claim 1, Applicants respectfully submit that claim 9 is also not obvious over Knutson in view of Shimizu.

Independent Claim 10

Independent claim 10 includes similar limitations to independent claim 1. Because of the similarities between independent claim 10 and independent claim 1, Applicants respectfully submit that claim 10 is also not obvious over Knutson in view of Shimizu.

New Claims 11-14

New claims 11-14 have been added. Support for claims 11-14 is found in Applicants’ specification at, for example, original claims 1-4 and page 5, lines 24-30. Claims 11-14 depend from and incorporate all of the limitations of independent claim 1. Thus, Applicants respectfully assert that claims 11-14 are allowable at least based on an allowable claim 1. Additionally, claim 11-14 may be allowable because of their individual limitations, respectively.

CONCLUSION

Applicants respectfully request reconsideration of the claims in view of the amendments and the remarks made herein. A notice of allowance is earnestly solicited.

Respectfully submitted,

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Date: May 20, 2009

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